

# REDUCED FOUR-WAVE MIXING RAMAN AMPLIFICATION ARCHITECTURE

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## Abstract of the Disclosure

Raman amplifiers with improved signal to noise ratio and four-wave mixing product suppression are provided. In one embodiment, both co-propagating and counter-propagating pump energy are employed to cause Raman amplification effects within a fiber. Improved Raman amplification performance including improved four-wave mixing product suppression facilitates longer distance transmission without regeneration of optical signals and/or denser WDM channel spacings.

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